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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,476	07/18/2002	Marc W. Cantell	BUR920010036	9681
30607	7590	08/24/2004	EXAMINER	
SCHMEISER, OLSEN & WATTS LLP			KANG, DONGHEE	
18 EAST UNIVERSITY DRIVE, #101				
MESA, AZ 85201			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/064,476

Applicant(s)

CANTELL ET AL.

Examiner

Donghee Kang

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 22-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-6, 8-11, 13-16 and 22-34 is/are allowed.
- 6) ☒ Claim(s) 7 & 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 7 & 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitch et al. (US 5,213,989).

Re claim 7, Fitch et al. teach a method for forming a transistor, the method comprising the steps of:

providing a semiconductor substrate (12, Fig.7); forming an epitaxial layer (18, Fig.7:Col.3, lines 8-11); forming a dopant source layer (50, Fig.9) on the epitaxial layer; diffusing dopant from the dopant source layer into the epitaxial layer to form at least a portion of an extrinsic base (52, Fig.10) for the transistor within the epitaxial layer, said portion of the extrinsic base being in direct mechanical contact with the dopant source layer, said portion of the extrinsic base being disposed between the dopant source layer (50) and an intrinsic base (44) for the transistor, said intrinsic base being totally within the epitaxial layer (18); and forming a pedestal (22, 40, & 42: Fig.8) on the epitaxial layer, wherein the dopant source layer (50:Fig.9) is formed around the such that the pedestal defines a portion of the epitaxial layer in which the dopant source layer is not formed on the epitaxial layer, wherein the step of forming a pedestral comprises forming silicon dioxide (22), a nitride layer (40) above the silicon oxide, and an oxide layer (42)

above the nitride layer, and patterning the silicon dioxide, nitride layer and oxide layer (Figs. 7 & 8), wherein the dopant source layer does not exist above the oxide layer (22).

Fitch et al. do not teach the silicon dioxide is high pressure oxide layer (HIPOX). However, Ozkan teaches forming high pressure oxide layer (132, Fig. 10) on the SiGe layer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form oxide layer under high pressure as taught by Ozkan in Fitch's device, since HIPOX layer is wet etched by a quick HF dip so that the emitter windows reveals SiGe base without damage.

Re claim 10, Fitch et al. teach a method for forming bipolar transistor on a semiconductor substrate, the method comprising the steps of (Figs.7-12):

providing a semiconductor substrate (12); forming an epitaxial layer (18) on the semiconductor substrate; forming a pedestal (22,44,&42:Fig.7) on epitaxial layer, the pedestal defining an emitter region of the epitaxial layer (Fig.11); forming a dopant source layer (50) on the epitaxial layer, the dopant source layer not formed on the epitaxial layer where the pedestal is on the epitaxial layer; and diffusing dopant from the dopant source layer into the epitaxial layer to form at least a portion of an extrinsic base (Col.7, lines 3-6) for the transistor within the epitaxial layer, said portion of the extrinsic base being in direct mechanical contact with the dopant source layer, said portion of the extrinsic base being disposed between the dopant source layer and an intrinsic base for the transistor, said intrinsic base being totally within the epitaxial layer, wherein the step of forming a pedestal comprises forming silicon dioxide (22), a nitride layer (40), and an

oxide layer (42), and patterning the silicon dioxide, nitride layer and oxide layer (Figs. 7 & 8), wherein the dopant source layer does not exist above the silicon oxide layer (22).

Fitch et al. do not teach the silicon dioxide is high pressure oxide layer (HIPOX). However, Ozkan teaches forming high pressure oxide layer (132, Fig. 10) on the SiGe layer. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form oxide layer under high pressure as taught by Ozkan in Fitch's device, since HIPOX layer is wet etched by a quick HF dip so that the emitter windows reveals SiGe base without damage.

.Allowable Subject Matter

3. Claims 1-6, 8-11, 13-16 & 22-34 are allowed.

Response to Arguments

4. Applicant's arguments filed 06-03-04 have been fully considered but they are not persuasive.

Applicant argues that Fitch and in view of Ozkan does not teach or suggest the feature "wherein the dopant source layer does not exist above the high pressure oxide layer". This is not convincing. Fitch clearly teaches in Fig.9 the dopant source layer 50 does not exist above the oxide layer (22).

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Donghee Kang whose telephone number is 571-272-1656. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Donghee Kang
Primary Examiner
Art Unit 2811

dhk